

Application No. 10/044,354
 Reply to Office Action dated August 11, 2004

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Previously Presented) An intravascular filter apparatus, comprising:
 an elongate shaft having a distal end and a lumen therethrough;
 a generally cylindrical filter coupled to the shaft near the distal end, the filter being porous and permeable to blood, the filter having a length and a diameter, the filter having an inner containment and an outside wherein the diameter of the filter is larger than the length; and an expansion member slidably disposed within the shaft, such that the expansion member is slidable into the inner containment of the filter to expand the filter.
2. (Original) The filter apparatus in accordance with claim 1, wherein the shaft comprises a catheter having a lumen extending therethrough.
3. (Original) The filter apparatus in accordance with claim 2, wherein the lumen comprises an aspiration lumen coupled to the filter.
4. (Cancelled)

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5. (Original) The filter apparatus in accordance with claim 4, wherein the expansion member is comprised of a radiopaque material.

6. (Original) The filter apparatus in accordance with claim 4, wherein the expansion member includes a generally straight proximal portion and a generally coiled distal portion.

7. (Original) The filter apparatus in accordance with claim 6, wherein the distal portion is comprised of nickel-titanium alloy.

8. (Original) The filter apparatus in accordance with claim 1, wherein the length of the filter is less than about 0.10 inches.

9. (Withdrawn) The filter apparatus in accordance with claim 1, wherein the filter is collapsible within an outer tubular member.

10. (Original) The filter apparatus in accordance with claim 1, wherein the filter includes a filter frame that is comprised of a super-elastic alloy.

11. (Previously Presented) An intravascular filter apparatus, comprising:
an elongate shaft disposed within an outer sheath, the shaft having a proximal end and a distal end;

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a disc shaped filter frame coupled to the shaft near the distal end, the filter frame having a diameter and a filter material permeable to blood coupled thereto; and means for aspirating embolic debris from the filter material.

12. (Original) The filter apparatus in accordance with claim 11, wherein the shaft comprises a catheter having a lumen extending therethrough and wherein means for aspirating embolic debris includes the lumen.

13. (Original) The filter apparatus in accordance with claim 11, further comprising means for expanding the filter.

14. (Original) The filter apparatus in accordance with claim 13, wherein means for expanding the filter includes an expansion member slidably disposed within the shaft.

15. (Original) The filter apparatus in accordance with claim 14, wherein the expansion member is comprised of a radiopaque material.

16. (Original) The filter apparatus in accordance with claim 14, wherein the expansion member includes a generally straight proximal portion and a generally coiled distal portion.

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17. (Original) The filter apparatus in accordance with claim 16, wherein the distal portion is comprised of nickel-titanium alloy.

18. (Original) The filter apparatus in accordance with claim 11, wherein the length of the filter frame is less than about 0.10 inches.

19. (Original) The filter apparatus in accordance with claim 11, wherein the filter frame is comprised of a super-elastic alloy.

20. (Original) The filter apparatus in accordance with claim 11, wherein the filter is collapsible within an outer tubular member.

21. (Withdrawn) A method of filtering embolic debris from a blood vessel, comprising the steps of:

providing an elongate tubular member having a filter frame collapsed therein, the filter frame being coupled to an elongate shaft and having a filter material coupled thereto;

advancing the tubular member to an area of interest within a blood vessel of a patient;

moving the tubular member relative to the shaft so as to shift the filter frame from a generally collapsed configuration to a generally expanded configuration, wherein expanded the filter frame is generally cylindrical in shape and has a diameter and a length, the diameter being larger than the length;

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performing an intravascular procedure that generates embolic debris;
 capturing embolic debris with the filter material; and
 aspirating the filter material.

22. (Withdrawn) The method in accordance with claim 21, wherein the shaft comprises a catheter having a lumen extending therethrough and wherein the step of aspirating the filter material includes aspirating embolic debris through the lumen.

23. (Previously Presented) A method of filtering embolic debris from a blood vessel, comprising the steps of:

providing a elongate shaft having a filter frame coupled thereto, the filter frame having a filter material permeable to blood coupled thereto, the shaft having an expansion member disposed therein;

advancing the shaft to an area of interest within a blood vessel of a patient;

actuating the expansion member so as to shift the filter frame from a generally collapsed configuration to a generally expanded configuration, wherein expanded the filter frame is generally cylindrical in shape and has a diameter and a length, the diameter being larger than the length;

performing an intravascular procedure that generates embolic debris;

capturing embolic debris with the filter material; and

aspirating the filter material.

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24. (Original) The method in accordance with claim 23, wherein the shaft comprises a catheter having a lumen extending therethrough and wherein the step of aspirating the filter material includes aspirating embolic debris through the lumen.

25. (Original) The method in accordance with claim 23, wherein the expansion member includes a proximal portion and a distal portion, and wherein the step of actuating the expansion member includes applying force in the distal direction to the proximal portion.

26. (Previously Presented) An intravascular filter apparatus, comprising:

an elongate shaft disposed within the outer sheath;

a blood-permeable filter coupled to the shaft, the filter having a length that is sufficiently small to permit use thereof at the junction of a portion of the renal artery and a kidney; and

means for aspirating embolic debris from the filter.

27. (Previously Presented) An intravascular filter apparatus, comprising:

an elongate shaft disposed within the outer sheath;

a blood-permeable filter coupled to the shaft, the filter having a length that is sufficiently small to permit use thereof at the junction of a portion of the renal artery and a kidney;

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means for aspirating embolic debris from the filter; and
 means for shifting the filter between a generally collapsed configuration and a generally expanded configuration.

28. (Withdrawn) A method of filtering embolic debris from a the renal artery, comprising the steps of:

providing an elongate tubular member having a filter frame collapsed therein, the filter frame being coupled to an elongate shaft and having a filter material coupled thereto;

advancing the tubular member to the junction of a portion of the renal artery and a kidney;

retracting the tubular member relative to the shaft so as to shift the filter frame from a generally collapsed configuration to a generally expanded configuration, wherein expanded the filter frame is generally cylindrical in shape and has a diameter and a length, the diameter being larger than the length;

performing an intravascular procedure that generates embolic debris;

capturing embolic debris with the filter material; and

aspirating the filter material.

29. (Previously Presented) A method of filtering embolic debris from a renal artery, comprising the steps of:

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providing a elongate shaft having a filter frame coupled thereto, the filter frame having a filter material permeable to blood coupled thereto, the shaft having an expansion member disposed therein;

advancing the shaft to the junction of a portion of the renal artery and a kidney;

actuating the expansion member so as to shift the filter frame from a generally collapsed configuration to a generally expanded configuration, wherein expanded the filter frame is generally cylindrical in shape and has a diameter and a length, the diameter being larger than the length;

performing an intravascular procedure that generates embolic debris;

capturing embolic debris with the filter material; and

aspirating the filter material.

30. (Previously Presented) An intravascular filter apparatus, comprising:

an elongate shaft having a distal end;

a generally cylindrical blood-permeable filter coupled to the shaft near the distal end, the filter having a length and a diameter and a generally circular cross section, the cross section having an area and being generally perpendicular to the length; and

wherein the diameter of the filter is larger than the length, and the length is generally constant across a substantial portion of the area.

31. (Previously Presented) The filter apparatus in accordance with claim 30, wherein the shaft comprises a catheter having a lumen extending therethrough.

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32. (Previously Presented) The filter apparatus in accordance with claim 31, wherein the lumen comprises an aspiration lumen coupled to the filter.

33. (Previously Presented) The filter apparatus in accordance with claim 30, further comprising an expansion member slidably disposed within the shaft.

34. (Previously Presented) The filter apparatus in accordance with claim 33, wherein the expansion member is comprised of a radiopaque material.

35. (Previously Presented) The filter apparatus in accordance with claim 33, wherein the expansion member includes a generally straight proximal portion and a generally coiled distal portion.

36. (Previously Presented) The filter apparatus in accordance with claim 35, wherein the distal portion is comprised of nickel-titanium alloy.

37. (Previously Presented) The filter apparatus in accordance with claim 30, wherein the length of the filter is less than about 0.10 inches.

38. (Previously Presented) The filter apparatus in accordance with claim 30, wherein the filter is collapsible within an outer tubular member.

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39. (Previously Presented) The filter apparatus in accordance with claim 30, wherein the filter includes a filter frame that is comprised of a super-elastic alloy.